

FIGURE 1B

## Velocity Dispersion Curves for Formation and Drill-Collar Dipole Modes

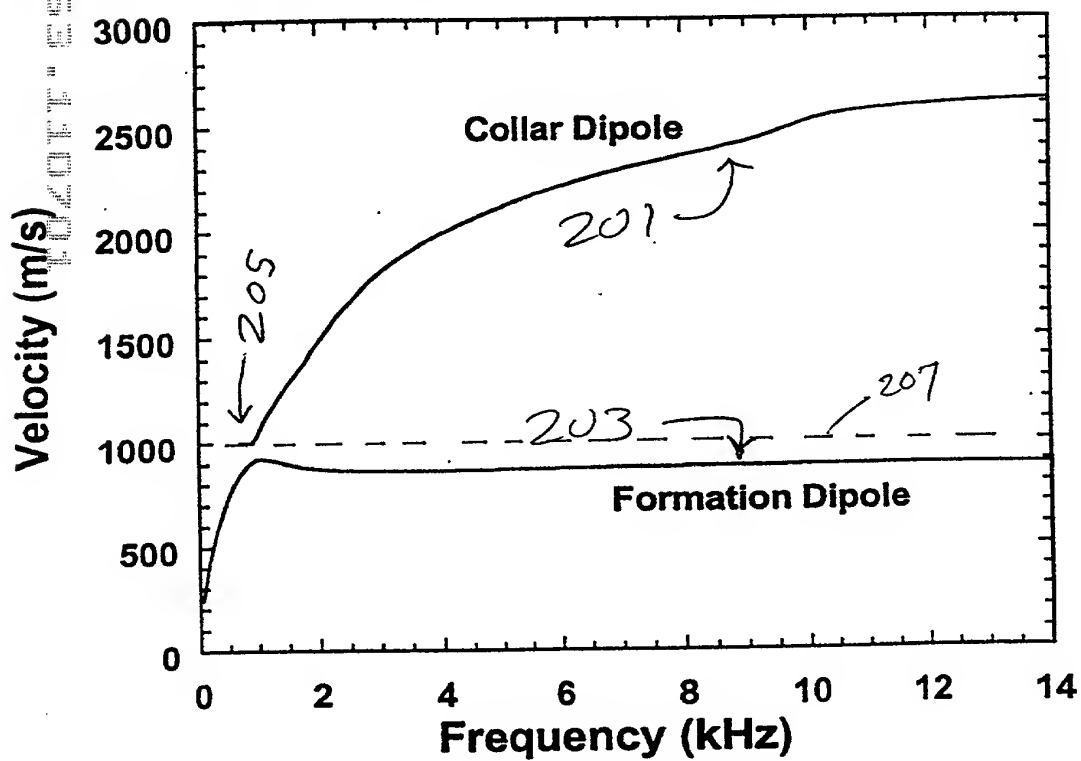


Figure 2

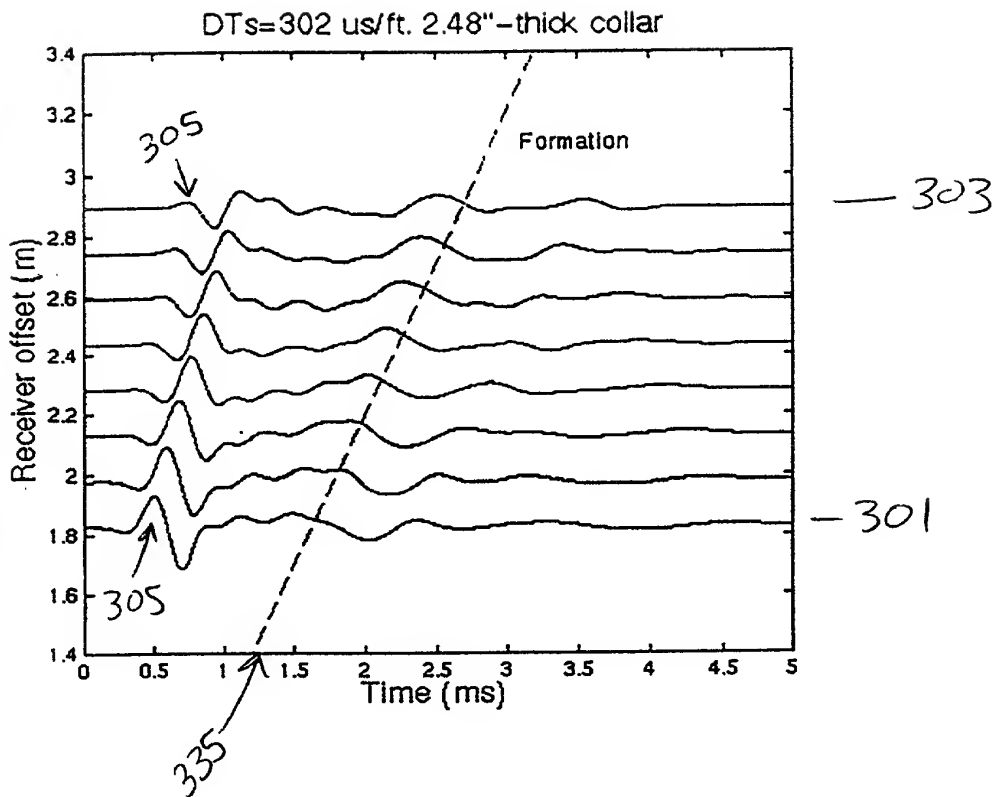


Figure 3  
Dipole waveform in the presence of a drilling collar

$\cos 2\theta$  azimuthal distribution of a quadrupole wavefield

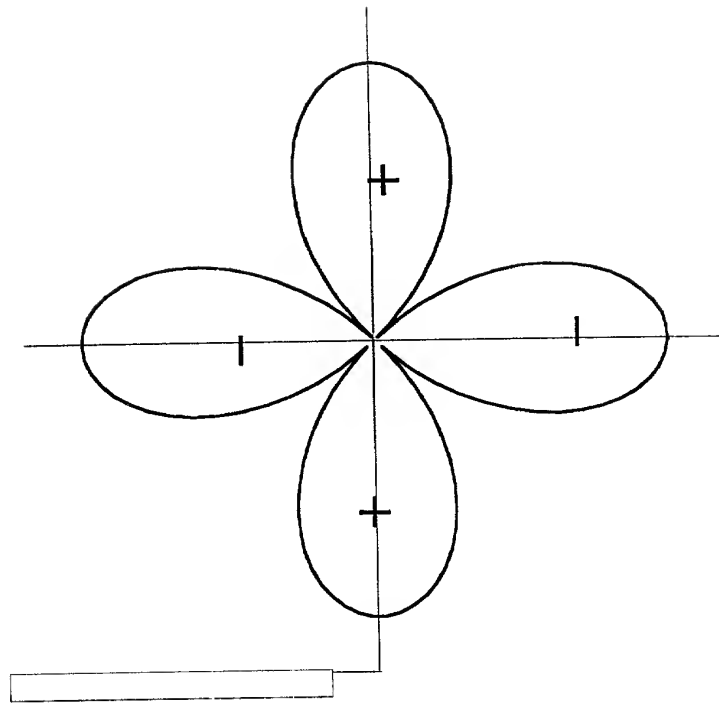


Fig. 49

FOOT E925400T

### Velocity Dispersion Curves for Formation and Drill-Collar Quadrapole Modes

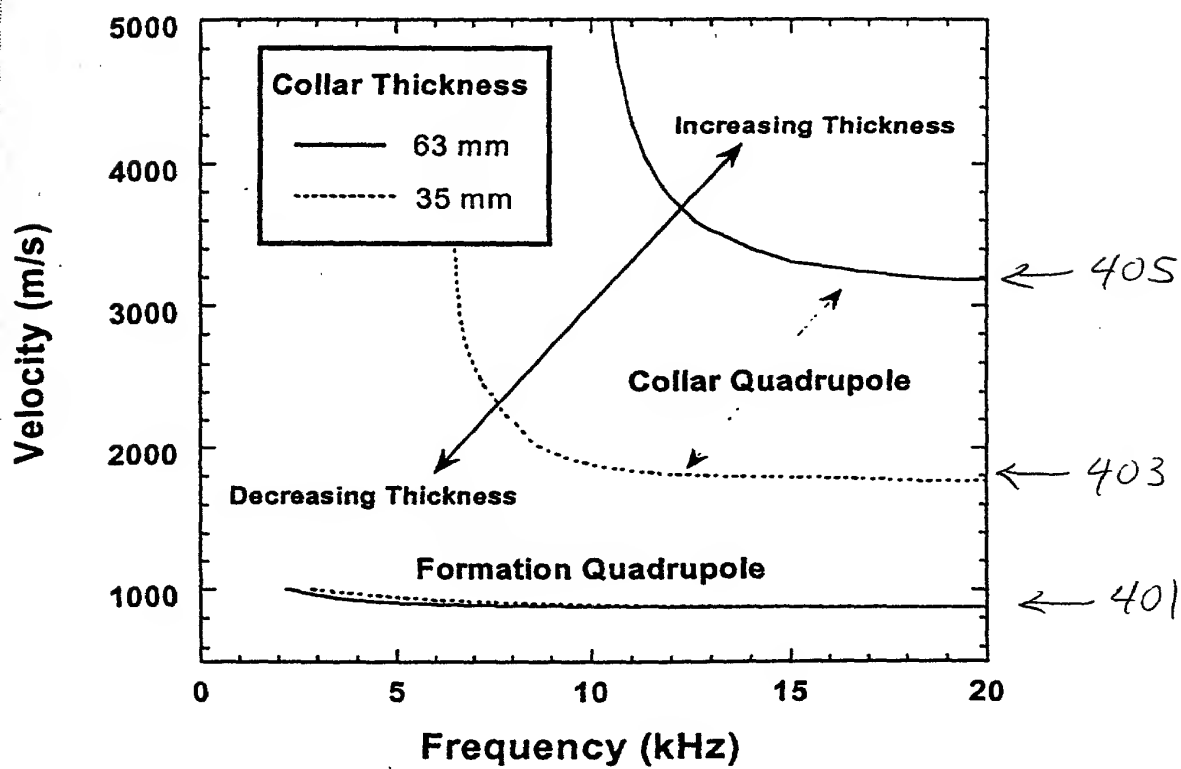


Figure 4 *6*

Figure 5A Wavefield snapshots

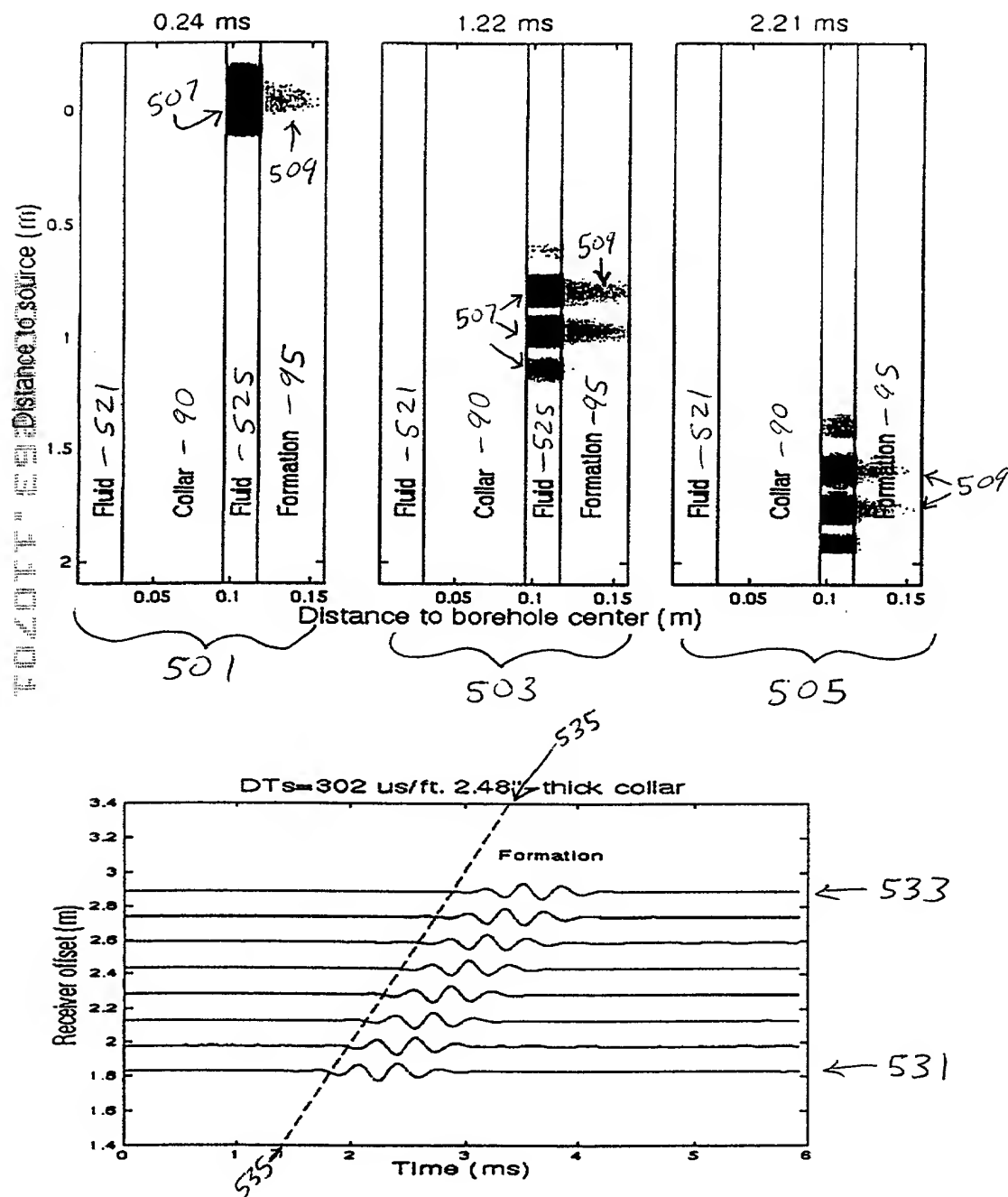


Figure 5B Quadrupole waveforms at various offsets

Figure 6A Wavefield snapshots, thin collar pipe

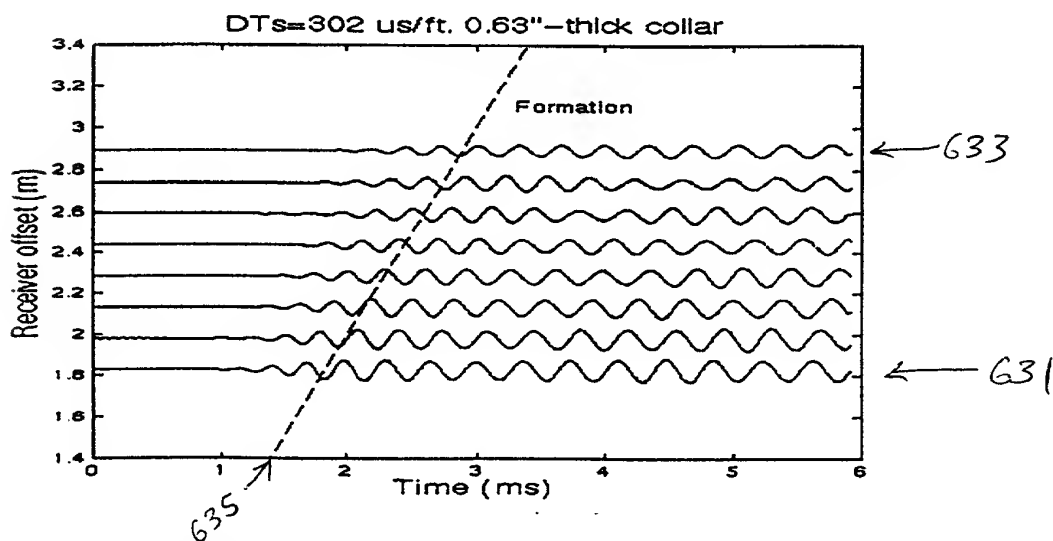
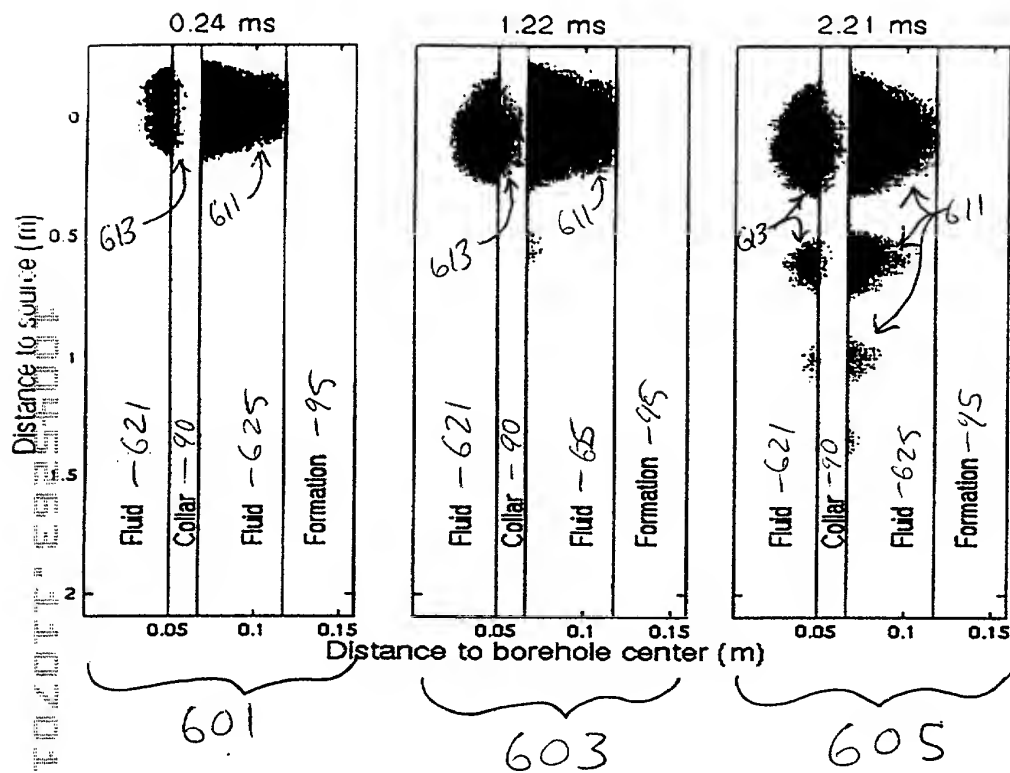


Figure 6B Quadrupole waveforms, thin collar pipe



10045363 110701

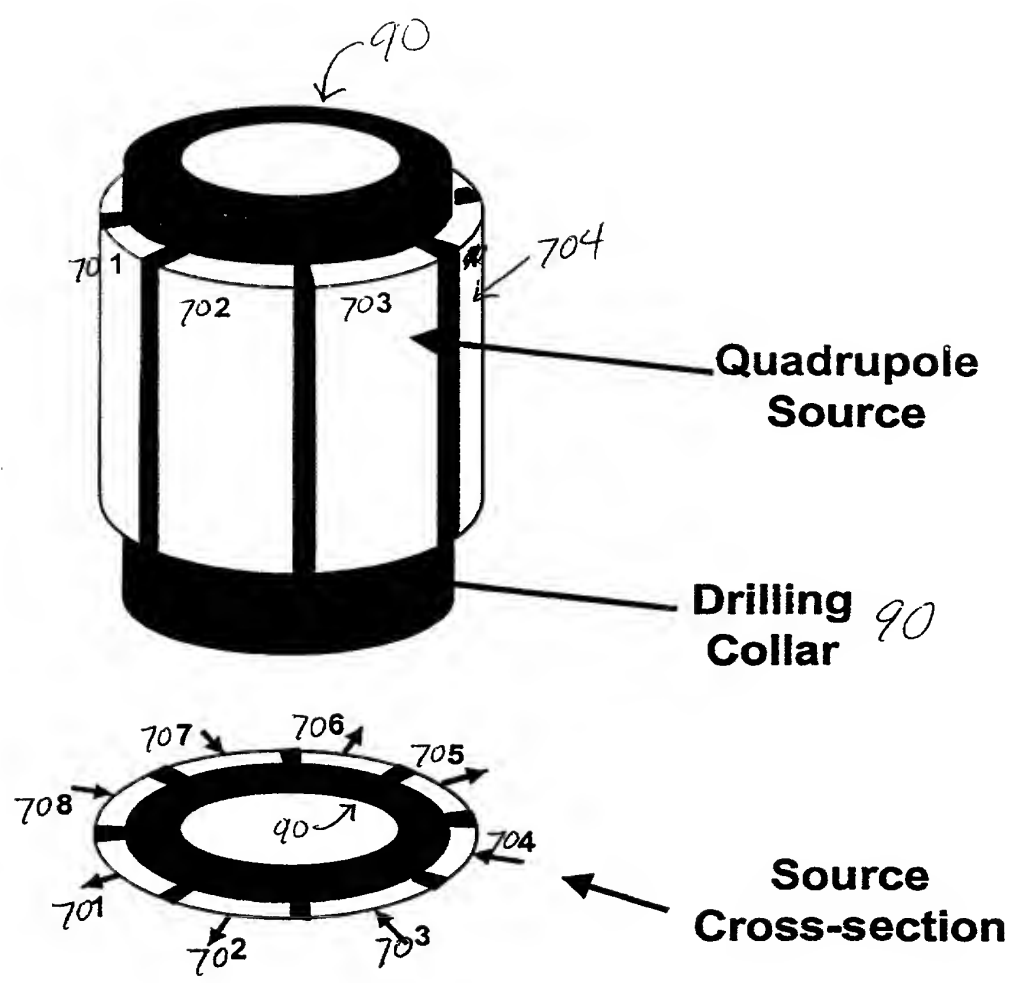


Figure 7

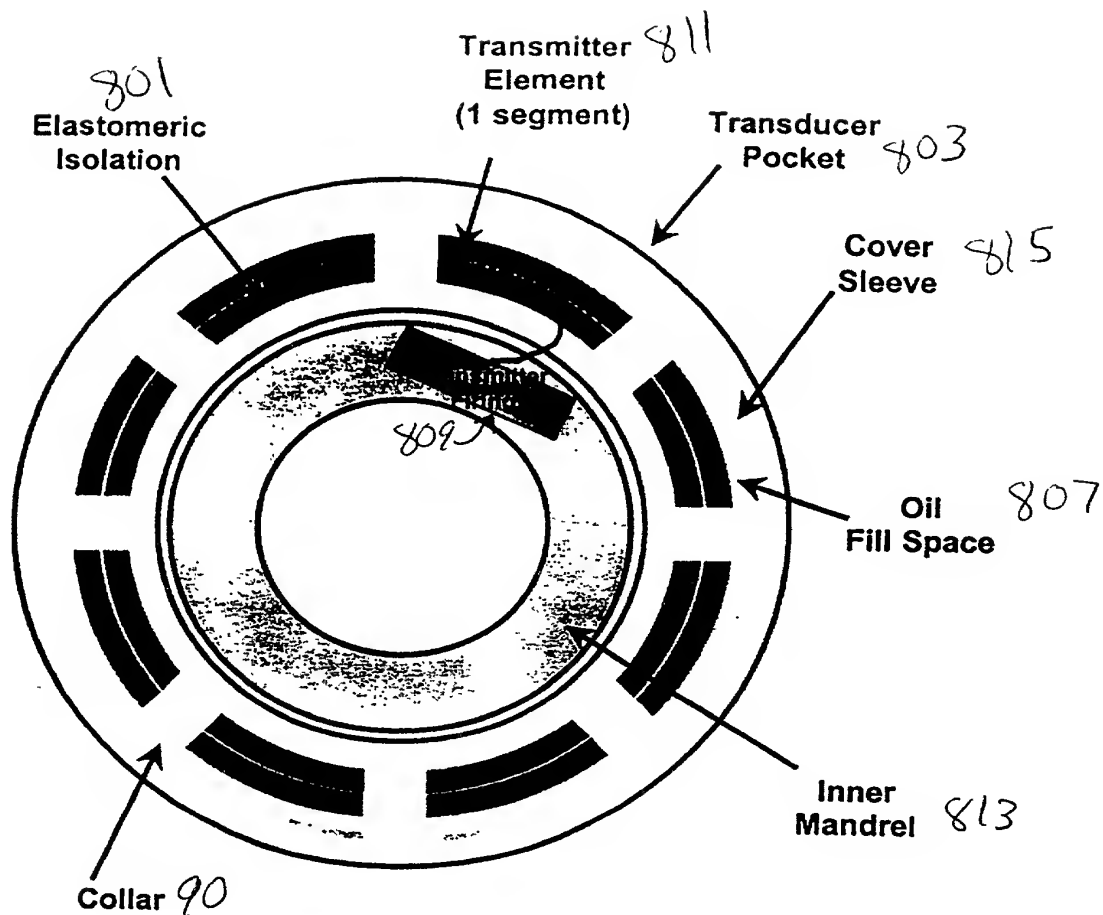


Figure 8 Segmented Ring Transmitter Example

1004553-110701

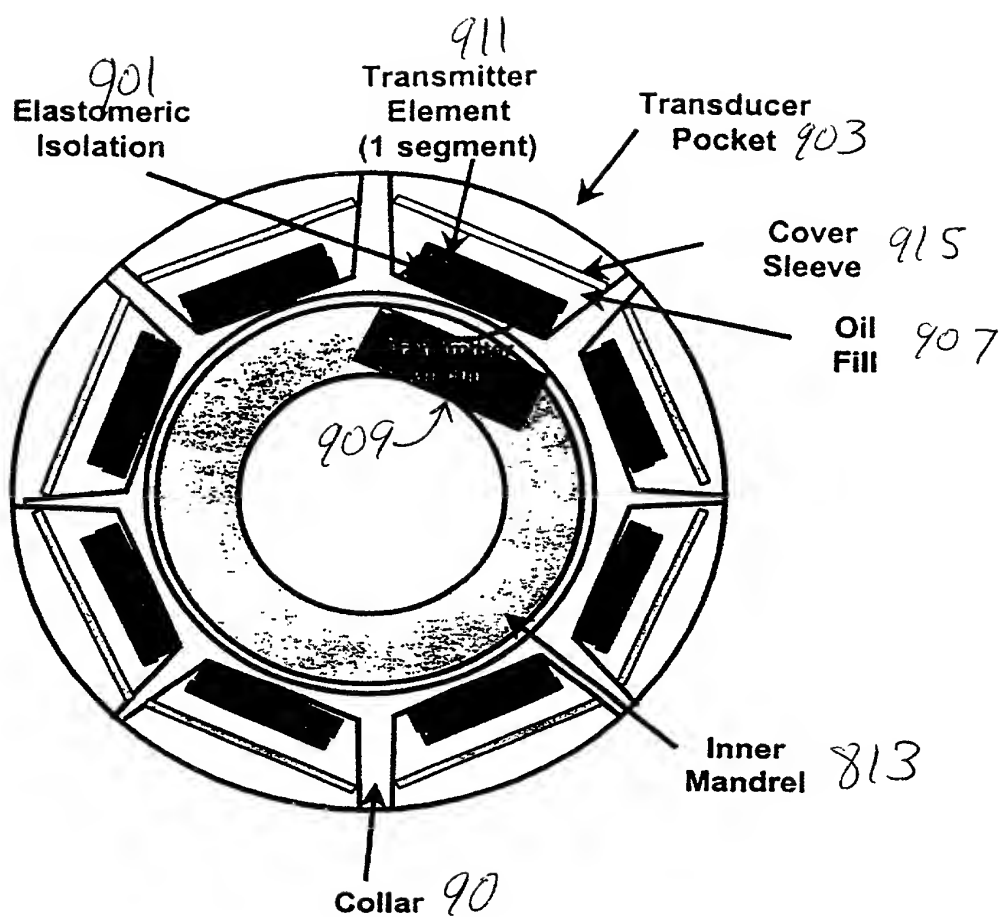


Figure 9 Individual Segmented Transmitter Example

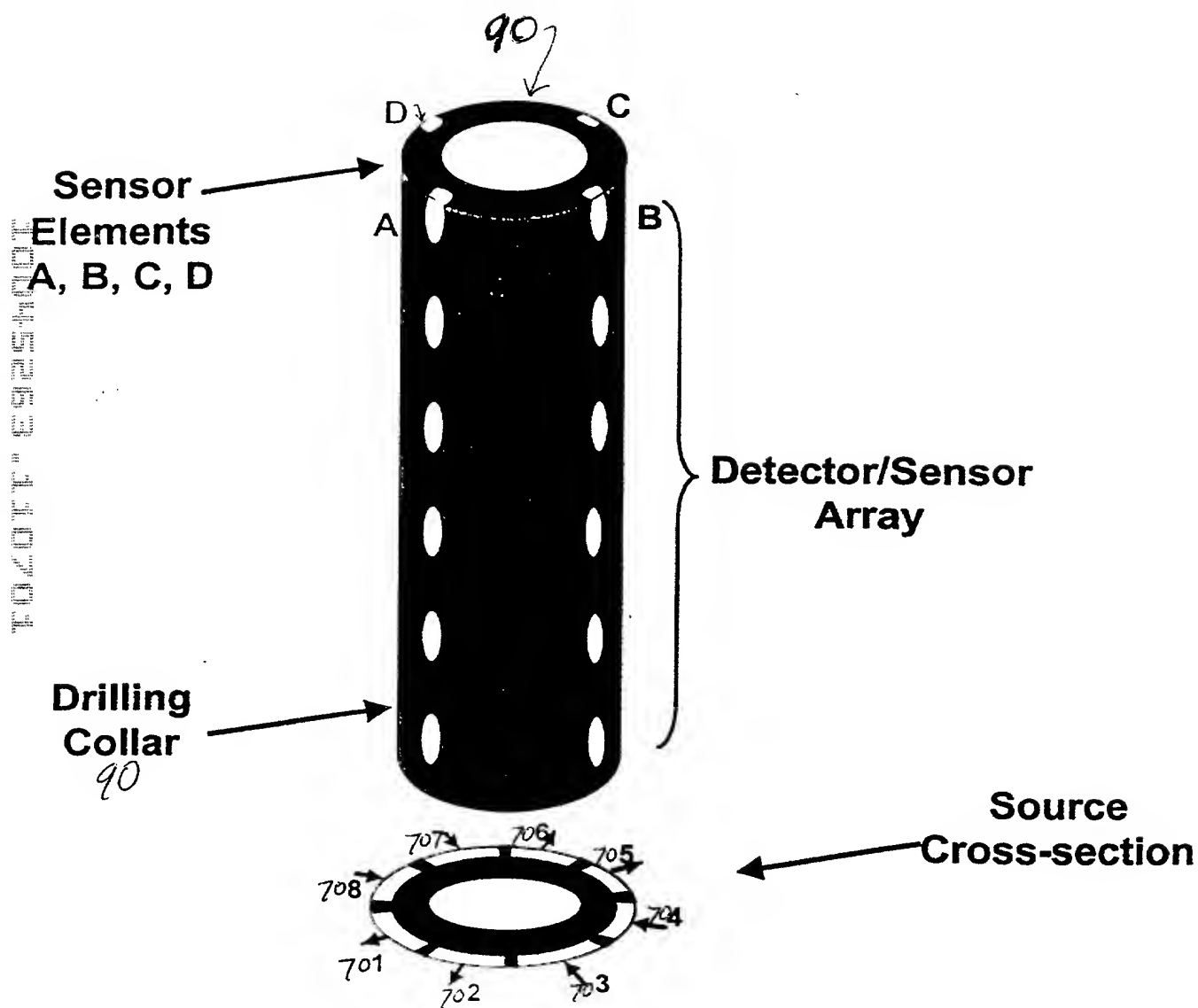


Figure 10 Sensor Array Layout

1005263 440701

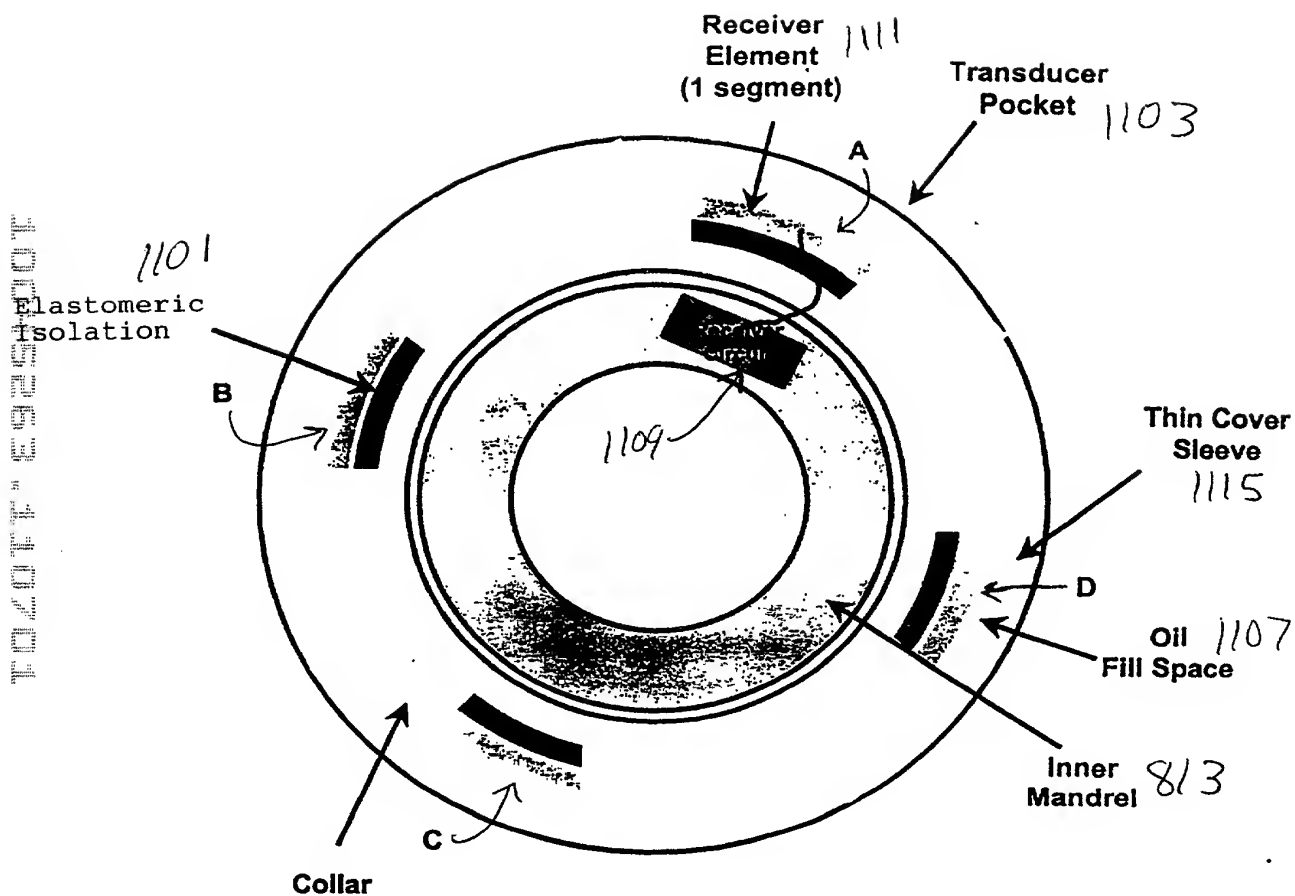


Figure 11 Segmented Ring Receiver Example

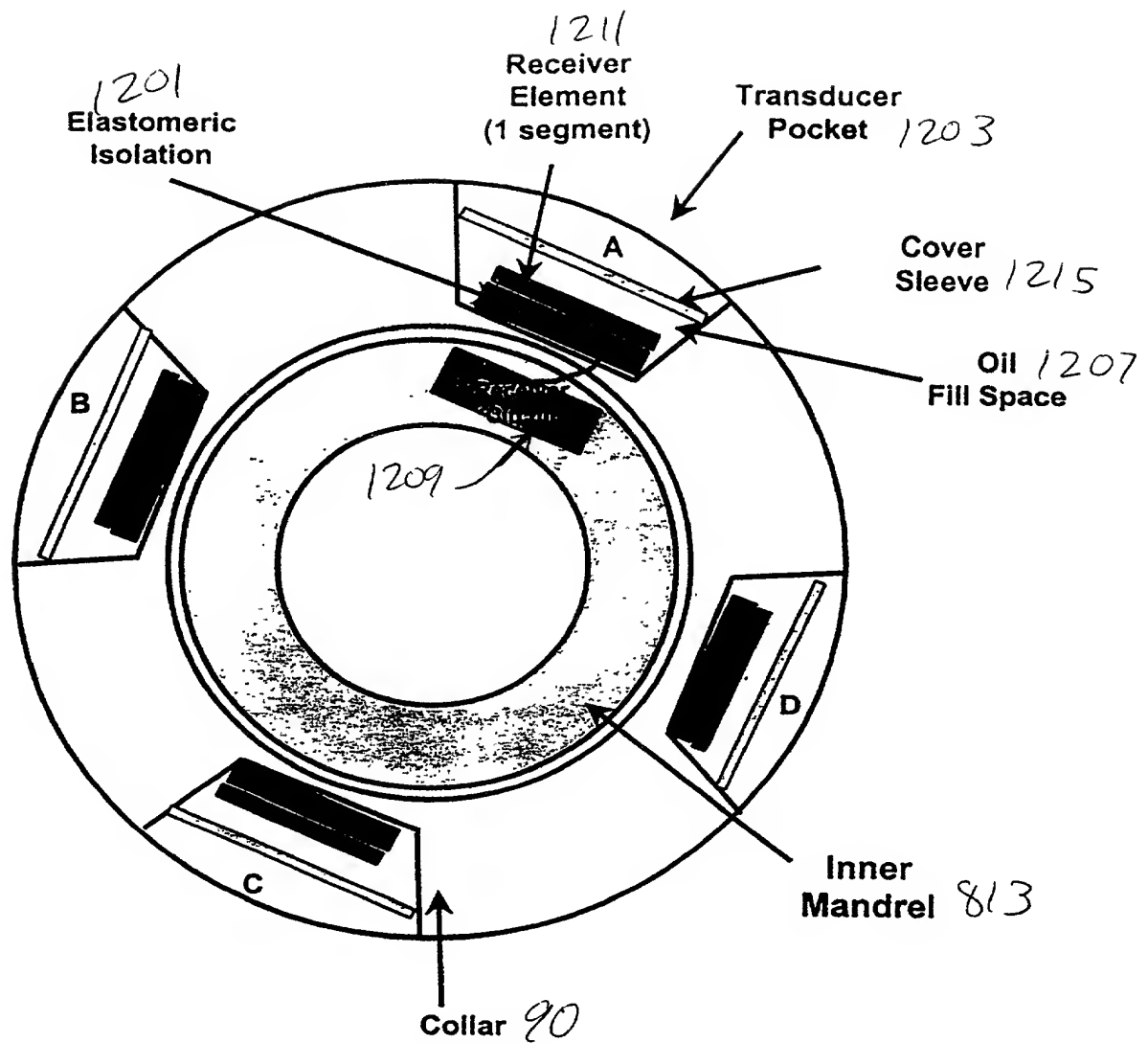


Figure 12 Individual Segmented Receiver Example

10045263 110701

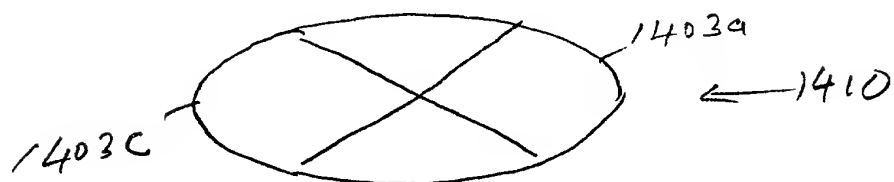
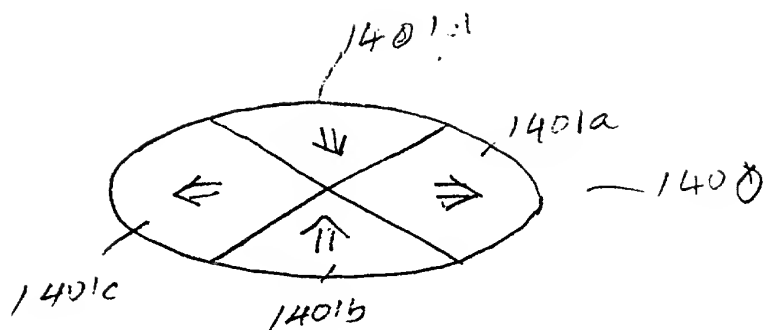


FIG. 13a

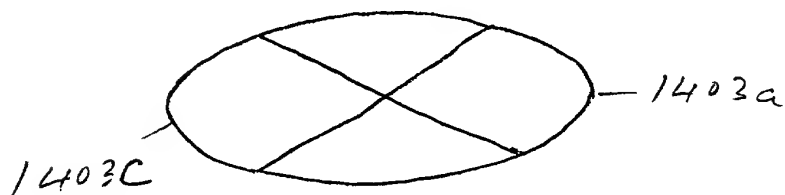
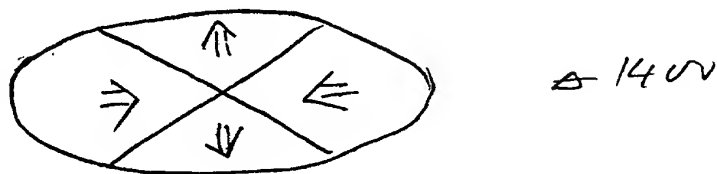


FIG. 13b

10045253, 110701

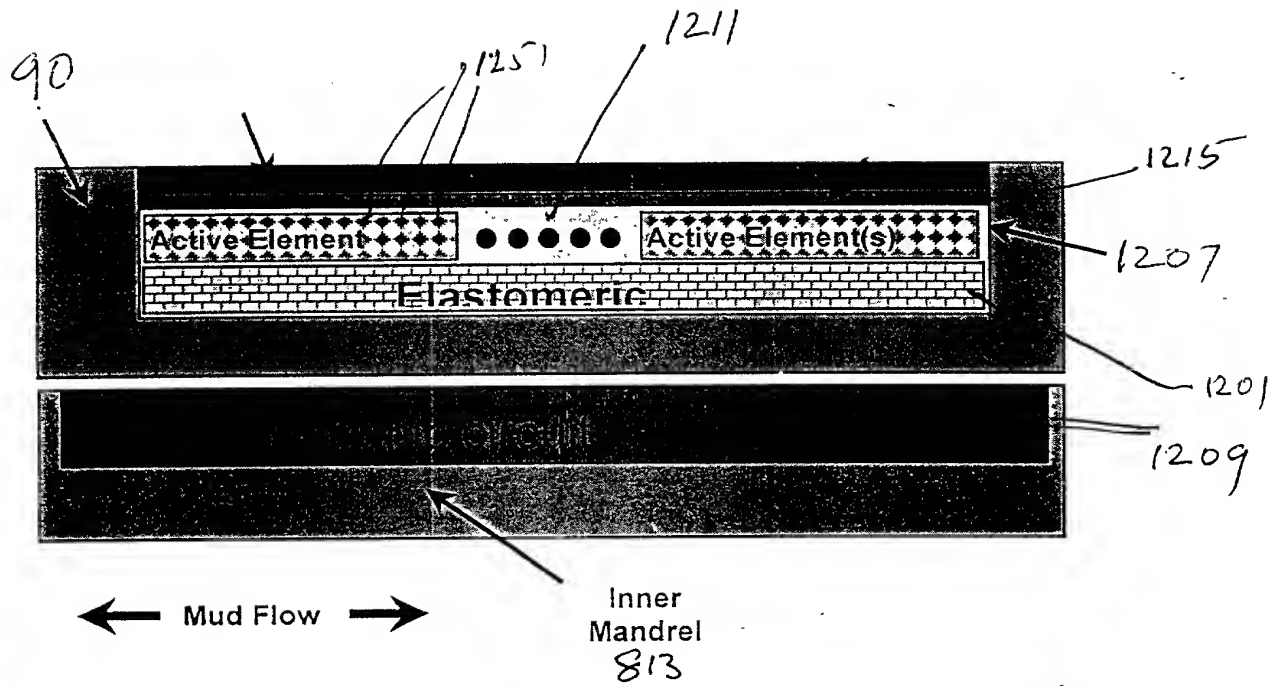


Fig. 14



Figure 15a

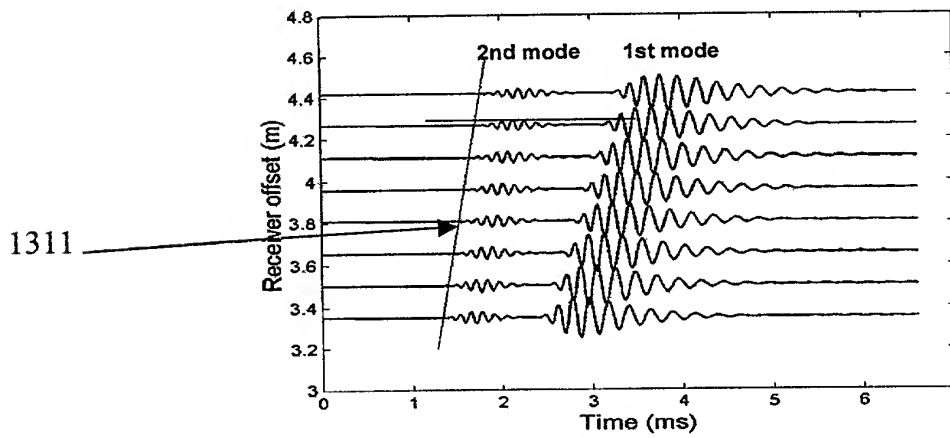
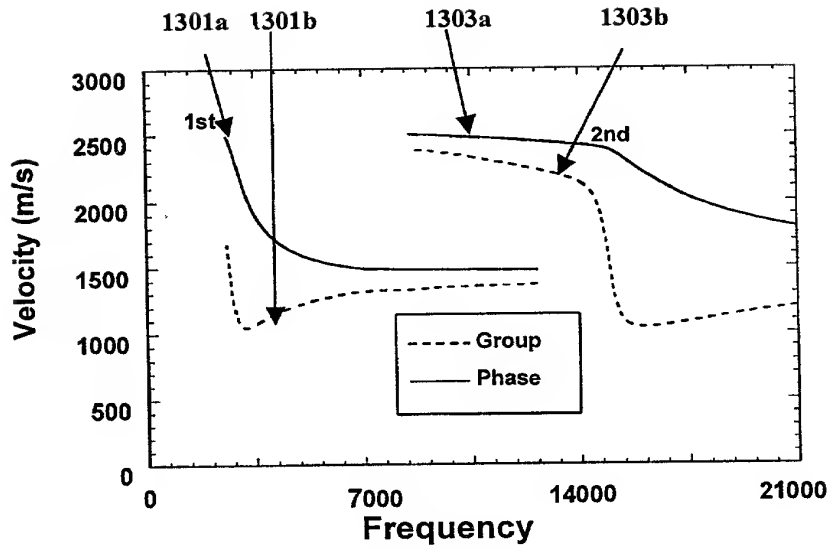


Figure 15b

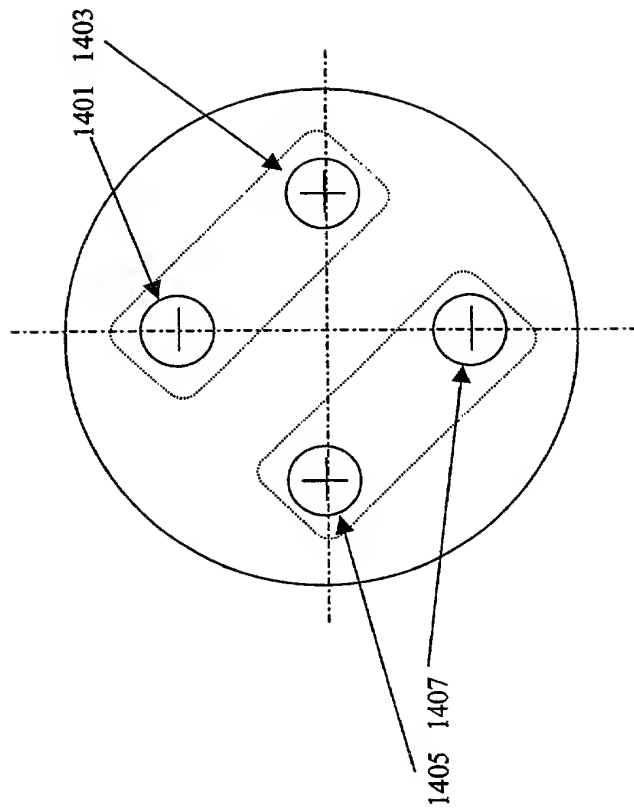


Figure 16

A conceptual composition of a quadrupole source/receiver by two dipole sources/receivers.